



Dart Hawkesbury
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

D4420-041

Job Sheet 168481



Part No: D4420-041

Job Qty: 1 ea

Part Name: Top Support Assembly



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 11/15/17

Job Tracking No:

Created By: Sylvie Boucher

Due Date: 11/24/17

Type: Stock

Description:

Note: DWG REV B SHEETS 1,3,4 IPP revA 11.06.30 new issue EC verified by:JLM IPP REV:B 12.03.01 AS PER DWG REV.B DD VERF:EC

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup hrs	Run Hrs	Workcenter / Supplier	Lead Time	
90	Start up Operation	1 Ea	11/23/17	11/23/17	0.00	0.00	Start Up Waterjet		SC
100	Waterjet	1 pcs	11/23/17	11/23/17	0.00	0.11	Waterjet1		SC
110	QC	1 pcs	11/23/17	11/23/17	0.00	0.00	QC2		SC DAS 38
120	QC	1 pcs	11/23/17	11/23/17	0.00	0.00	QC8		SC 38
125	Brake NC	1 pcs	11/23/17	11/23/17	0.00	0.17	Brake NC 2		SC DAS 38
127	QC	1 pcs	11/23/17	11/23/17	0.00	0.00	QC6		SC 38
130	HandFinish	1 pcs	11/23/17	11/23/17	0.00	0.06	HandFinish1		2017-11-22 JSL
131	QC	1 pcs	11/23/17	11/23/17	0.00	0.00	QC7		SC 38
133	Small Fab	1 pcs	11/23/17	11/23/17	0.00	0.12	Small Fab		SC DAS 38
136	QC	1 pcs	11/23/17	11/23/17	0.00	0.00	QC5		SC 38
139	Powdercoat	1 pcs	11/23/17	11/23/17	0.00	0.33	Powdercoat9		SC 38
140	QC	1 pcs	11/23/17	11/23/17	0.00	0.00	QC3		SC 38
150	Small Fab	1 pcs	11/24/17	11/24/17	0.00	0.12	Small Fab		SC DAS 38
160	QC	1 pcs	11/24/17	11/24/17	0.00	0.00	QC5		SC 38
190	Packaging	1 pcs	11/24/17	11/24/17	0.00	0.00	Packaging3	5090	SC 38
200	QC21-SA	1 Ea	11/24/17	11/24/17	0.00	0.00	QC21		SC 38

Part Op 100 - 1- Cut D4420-1 as per dwg prog rev: B dwg rev: B 2- Debur as per dwg
Descriptions: 133 - ONLY Install D4006-3 to D4420-1

139 - START TIME: 7:50 OVEN TEMPERATURE: 320° FINISH TIME: 8:20 11/22/17

150 - Assemble anchormut and foam as per dwg D4420

11/22/17

Job Allocations

Operation	Component Part	Required	Inventory	Allocated	Std Qty
90-Start up Operation	M2024T3S.063	0	309	0	0
133-Small Fab	D4006-3 5010742	1	0	0	0
	MS20470AD4-5 FM136851-2	4	1,008	0	0
150-Small Fab	D4006-5 F165490	1	5	0	0
	MS20426AD3-4 FM136444-2	2	6,791	0	0
	MS21059L4 FM137736-3	1	39	0	0

Part Specifications

Specifications could not be found.

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE



QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION		AGAINST DEPARTMENT/PROCESS			
	Rework ☐	Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	
	Scrap ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	
	Use-as-is ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	
	Suspected Unapproved ☐	Large Fab ☐	Composite ☐	Supplier ☐		

Date : _____	Step #: _____	QTY Effective : _____	MRB (QS1042) Approval _____
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Description Work Order Deviat

Job No: 168481

Mfg Date: 11/16/17

Start up Operation

Change No:

Operation:

Revision:

PART NO: D4420-041

Top Support Assembly

Completed By _____

hand / Supervisor _____

roval Verification _____

QA Coordinator _____

Approval _____

Root Cause Environment ☐ No Re-verification ☐ Design ☐ Operator ☐ Doc/Data ☐ Offset/Setup ☐ Equip/Tooling ☐ Supplier ☐ Handling/Pre ☐ Training ☐ Material ☐ Use for Testing ☐ Internal Transport ☐ Poor Information ☐ Tribal Knowledge ☐ Rushing ☐ LOA ☐ Product Improvement ☐ Substation ☐ Process Improvement ☐ Past Expiry Date ☐ Manufacturing Process ☐ Misidentified ☐ Past Due ☐		Pressure ☐ Bending ☐ Centre M ☐ Cracks ☐ Crimp/K ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ OTHER : ☐	Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐	Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐
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 Hawkesbury, ON K6A 1K7
 CANADA
 TEL: 1 613 632-5200
 Email: sales@dartaero.com
 www.dartaerospace.com



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 tside Dimensions
 er/Under tolerance
 t Incorrect
 t Lost/Missing
 t Moved

DQA: _____ Date: _____



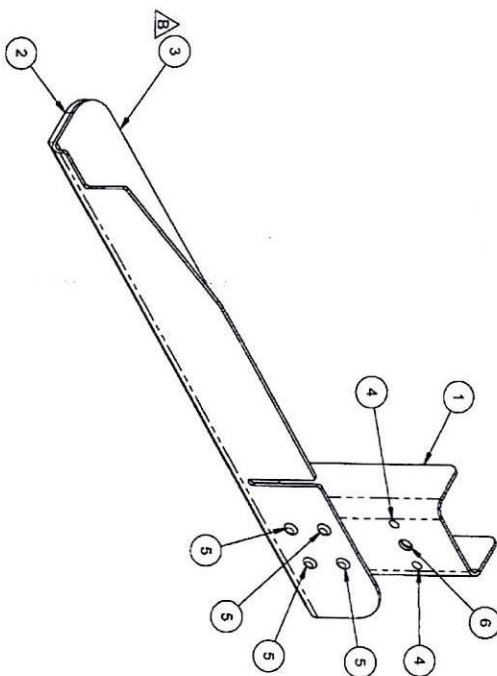
WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐																																																																															
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval																																																																													
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ITEM	QTY	P/N	DESCRIPTION
X	D4420-041		TOP SUPPORT ASSY
1	1	D4006-3	CHANNEL
2	1	D4006-5	FOAM
3	1	D4420-1	ANGLE
4	2	MS20426AD3-4	RIVET
5	4	MS20470AD4-5	RIVET
6	1	MS21059L4	ANCHOR NUT



D4420-041 TOP SUPPORT ASSY

- NOTES:**
- 1) MATERIAL: NA
 - 2) FINISH: POWDER COAT "ANSI 61 GREY" (4.3.5.15) PER DART OSI 005 4.3
 - 3) TOLERANCES: PER DART OSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK: SHARP EDGES: 0.005 TO 0.010 MAX
 - 6) IDENTIFICATION: IDENTIFY WITH DART P/N "D4420-041" AND B/N PER OSI 044 6.1
 - 7) WEIGHT: 0.38 lbs

REV.	DESCRIPTION	BY	DATE
A	ADD RELIEFS FOR COMPATIBILITY WITH ELROCOPTER (4.3.5.6)	MB	12.02.21
B	SQUIRREL CHEEK FINISH WAS TOREY SANDING (REF. PART 1-129)	MB	11.06.22
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE 12.02.21			
TITLE			
TOP SUPPORT ASSY			
SCALE			
NTS			

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SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 168481

DAS
30
9-89

NOV 15 2017

RELEASED
2012-03-02
VWP

DQA: _____ Date: _____



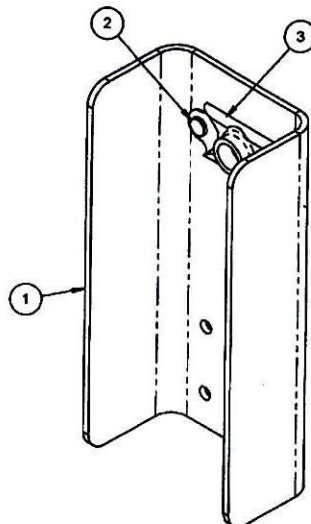
WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date :	Step #:	QTY Effective :		MRB (QSI042) Approval	
Description Work Order Deviation			Disposition		
			Completed By		
			Lead hand / Supervisor Approval Verification		
			QC / QA Coordinator Approval		
Root Cause		FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐	Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐
OTHER : _____					

ITEM	QTY -043	P/N	DESCRIPTION
	X	D4420-043	TOP LEG SUPPORT ASSY
1	1	D4006-3	CHANNEL
2	2	MS20426AD3-4	RIVET
3	1	MS21059L4	ANCHOR NUT



D4420-043 TOP LEG SUPPORT ASSY

RELEASED
2012-03-08
AM

NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: POWDER COAT "ANSI 61 GREY" (4.3.5.15) PER DART QSI 005 4.3 BEFORE INSTALLATION OF MS21059-4 ANCHOR NUTS B
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N "D4420-043" AND B/N PER QSI 044 6.1
- 7) WEIGHT: 0.09 lbs

DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. B
MFG. APPR.		D4420	SHEET 2 OF 4
APPROVED		TITLE	SCALE
DE APPR.		TOP SUPPORT ASSY	NTS
DATE	12.02.21	COPYRIGHT © 2011 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL, AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSES OR REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS WITHOUT THE WRITTEN PERMISSION OF DART AEROSPACE LTD.	

DQA: _____ Date: _____

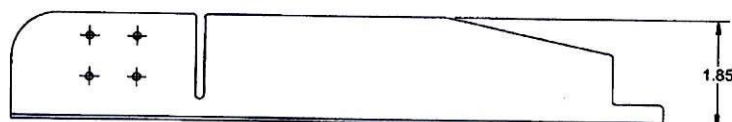
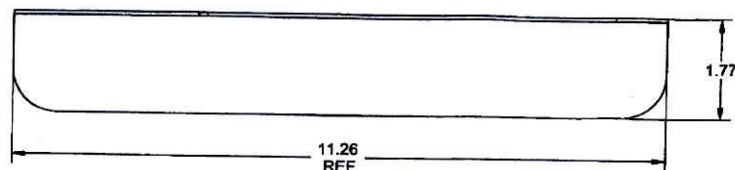
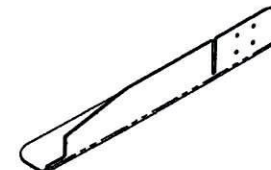


WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date :	Step #:	QTY Effective :		MRB (QSI042) Approval	
Description Work Order Deviation			Disposition		
			Completed By		
			Lead hand / Supervisor Approval Verification		
			QC / QA Coordinator Approval		
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐			
OTHER : _____					



D4420-1 ANGLE

RELEASE
2012-03-02

NOTES:

- 1) MATERIAL: MADE FROM D4420-1F
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: N/A
- 7) WEIGHT: 0.22 lbs

DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. B
MFG. APPR.		D4420	SHEET 3 OF 4
APPROVED		TITLE	SCALE
DE APPR.		TOP SUPPORT ASSY	NTS
DATE	12.02.21	COPYRIGHT © 2011 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND UNCLASSIFIED. IT IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR REPRODUCED IN ANY MANNER WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

DQA: _____ Date: _____

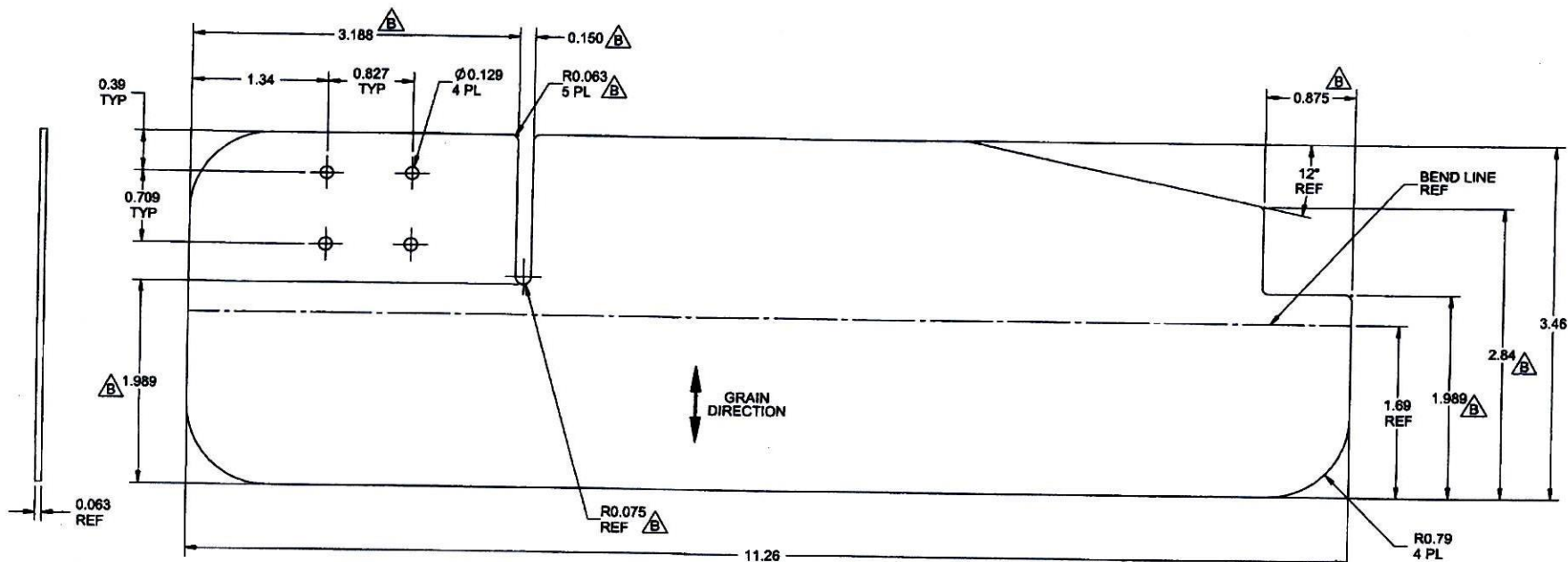


WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					
Root Cause		FAULT CATEGORY							
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐				
Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐				
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Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐				
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐				
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐				
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐				
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐				
Past Expiry Date ☐	Manufacturing Process ☐	OTHER : _____							
Misidentified ☐	Past Due ☐								



D4420-1F FLAT PATTERN

RELEASED
2012-03-03
JMB

NOTES:

- 1) MATERIAL: 2024-T3 ALUMINUM SHEET, 0.063 THICK
PER QQ-A-250/4 OR AMS-QQ-A-250/4
OR AMS 4037 OR ASTM B209
REF DART SPEC M2024T3S.063
- 2) FINISH: N/A
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: N/A
- 7) WEIGHT: 0.22 lbs

DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. B
MFG. APPR.		D4420	SHEET 4 OF 4
APPROVED		TITLE	SCALE
DE APPR.		TOP SUPPORT ASSY	NTS
DATE	12.02.21	COPYRIGHT © 2011 BY DART AEROSPACE LTD	
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DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					
Root Cause		FAULT CATEGORY							
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐				
Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐				
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐				
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐				
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐				
Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐				
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐				
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐				
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐				
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐				
Past Expiry Date ☐	Manufacturing Process ☐	OTHER : _____							
Misidentified ☐	Past Due ☐								